

Listing of the Claims

This listing of claims will replace all prior versions, and listings, of the claims:

1. (original) A system for audio reproduction comprising:
 - means for obtaining one or more audio signals that are representative of sounds occurring at a first location;
 - means for communicating the audio signals from the first location to a second location of a person;
 - means for determining a position of the head of the person in at least two dimensions at the second location by imaging the person; and
 - plural means for reproducing an audio field at the second location from the audio signals, wherein sounds emitted by each means for reproducing are controlled based on the position of the head of the person.
2. (original) The system according to claim 1, wherein the audio field is reproduced in real time.
3. (original) The system according to claim 1, wherein said means for determining repeatedly determines the position of the person and wherein said means for reproducing is continuously controlled in response to changes in the position of the head of the person.
4. (original) The system according to claim 1, wherein the position of the head of the person is determined in horizontal directions and wherein volume for reproduction by each means for reproducing is controlled based on the horizontal distance between the head of the person and the means for reproducing.
5. (original) The system according to claim 4, wherein each of the plural means for reproducing comprises a speaker.

6. (original) The system according to claim 4, wherein each of the plural means for reproducing comprises at least a pair of vertically arranged speakers.

7. (original) The system according to claim 1, wherein the position of the person is determined in three dimensions, including horizontal and vertical directions.

8. (original) The system according to claim 7, wherein each of the plural means for reproducing comprises at least a pair of vertically arranged speakers.

9. (original) The system according to claim 8, wherein the volume of reproduction by each of a pair of vertically arranged speakers is based on the position of the head of the person in the vertical direction.

10. (original) The system according to claim 9, wherein when the head of the person is positioned below a vertical threshold, substantially all of the sound reproduced by the pair of the speakers is reproduced by a vertically lower one of the pair and wherein when the head of the person is positioned above the vertical threshold, substantially all of the sound reproduced by the pair of speakers is reproduced by a vertically higher one of the pair.

11. (original) The system according to claim 10, wherein the threshold is hysteretic.

12. (original) The system according to claim 10, wherein when the head of the person transitions across the threshold, transitioning of the sounds from one speaker of the pair to the other is gradual.

13. (original) The system according to claim 1, wherein the plural means for reproducing are arranged spaced apart and directed toward a center and wherein a particular one of the audio signals applied to a particular one of the means for reproducing is multiplied by a ratio of a horizontal distance between the particular means for reproducing and the head of the person to a horizontal distance between the particular means for reproducing and

the center.

14. (original) The system according to claim 1, wherein the particular one of the audio signals is multiplied by a factor related to the position to determine a desired signal level for the particular one of the audio signals and when the desired signal level is substantially different from a current signal level gradually adjusting the current signal level toward the desired signal level.

15. (original) The system according to claim 14, wherein the sounds are digitally sampled at a sampling rate and the current signal level is incrementally adjusted in uniform increments, one adjustment for each of a predetermined number of samples.

16. (original) The system according to claim 15, wherein the increment is related to a difference between the desired signal level and the current signal level.

17. (original) The system according to claim 1, wherein the plural means for reproducing are arranged spaced apart and directed toward a center and wherein a particular one of the audio signals applied to a particular one of the means for reproducing is time delayed based on the position of the person.

18. (original) The system according to claim 17, wherein the particular one of the audio signals is time delayed by:

 computing a desired delay by determining a distance between the head of the person and the particular one of the means for reproducing, subtracting the difference by a maximum distance between the head of the person of the particular one of means for reproducing to determine a result and dividing the result by the speed of sound; and

 when the desired delay is substantially different from a current delay, gradually adjusting the current delay toward the desired delay.

19. (original) The system according to claim 18, wherein the sounds are digitally sampled at a sampling rate and the current delay is gradually adjusted by approximately between

three and ten percent of the sampling rate.

20. (original) The system according to claim 1, further comprising means for displaying visual images to the user including a source of the sounds.

21. (original) A method for audio reproduction comprising:

- obtaining one or more audio signals that are representative of sounds occurring at a first location;

- communicating the audio signals from the first location to a second location of a person;

- determining a position of the head of the person in at least two dimensions at the second location by imaging the person; and

- reproducing an audio field at the second location from the audio signals, wherein sounds emitted by each of plural means for reproducing are controlled based on the position of the head of the person.

22. (original) The method according to claim 21, wherein volume of reproduction is controlled based on the position of the head of the person

23. (original) The method according to claim 21, wherein delay associated with volume of reproduction by each means for reproducing is controlled based on the position of the head of the person.

24. (original) The method according to claim 21, wherein the audio field is controlled based on the position of the person's head in three dimensions.

25. (original) A telepresence system comprising:

- a display booth having a plurality of cameras for obtaining images of a person within the display booth;

- a computer system for determining a position of the head of the person in at least two dimensions from the images of the person; and

a plurality of speakers for reproducing an audio field at the display booth, wherein the audio field is controlled based on the position of the head of the person.

26. (original) The telepresence system according to claim 25, wherein volume of reproduction by each speaker is controlled based on the position of the head of the person.

27. (original) The telepresence system according to claim 25, wherein delay associated with volume of reproduction by each speaker is controlled based on the position of the head of the person.

28. (original) The telepresence system according to claim 25, wherein the audio field is controlled based on the position of the person's head in three dimensions.